

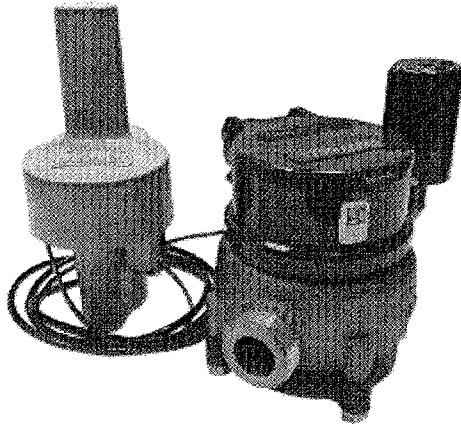
Exhibit D

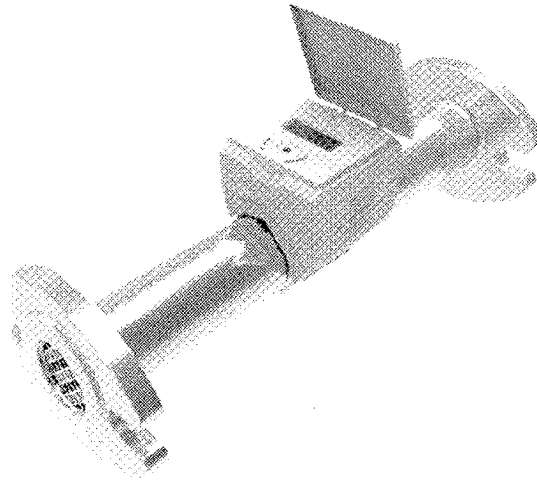
Rein Tech March 24, 2023 Claim Chart Prepared by Plaintiff's Prior Counsel

**Plaintiff Rein Tech Inc.'s
U.S. Patent No. 11,549,837 ('837 Patent)
Claims 42, 45, 47, 48, and 49**

Accused Products

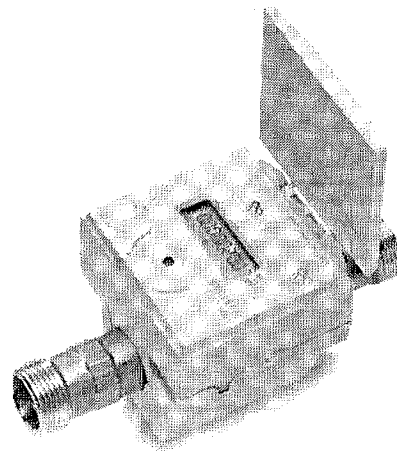
Mueller 420RDM (Remote Disconnect Meter)
Mi.Net® LoRaWAN (LW) Meter Interface Unit (Node)
Solid State Meter (SSM)
Cellular Node Meter Interface with MiNet®

'837 Patent Claim 42	
A water meter and leak detection system comprising:	The Mueller 420 RDM with Mi.Net® (LW) and Cellular Node is a water meter and leak detection system.
a base station having a water control mechanism interposed between a main water supply line and a water supply for a building or structure;	<p>The Mueller 420 RDM and SSM Meters with Mi.Net® LW Meter Interface and Cellular Node Meter Interface with Mi.Net® has a base station; (Exhibit 5 at MUE000000121), (Exhibit 23 at MUE000000165 and MUE00000168),</p> <div></div> <p>5/8" x 3/4" Remote Disconnect Meter</p> <p>(Exhibit 5 at MUE000000121)</p>



**Mueller Systems Solid State Meter
Sizes 1½" & 2"**

(Exhibit 23 at MUE000000176)



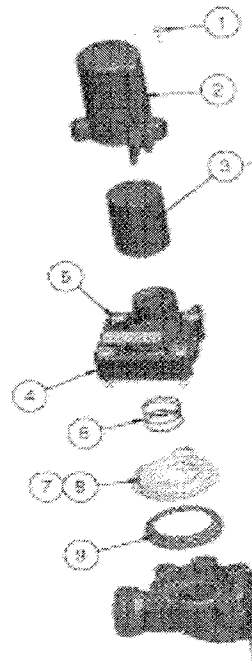
**Mueller Systems Solid State Meter
5/8" X 3/4" - 1"**

(Exhibit 23 at MUE000000179)

a water control valve mechanism;, "Remote Disconnect Enabled Compatibility" and "Compatible with Mueller System 420 RDM, water utilities can remotely initiate a command to turn a water service on or off", (Exhibit 3 at

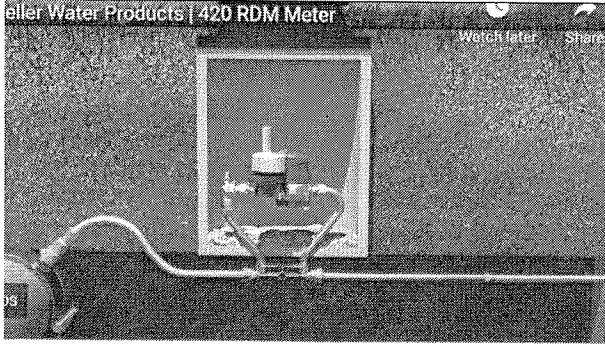
RT009371, “The MiNet LW node has the built-in capability to seamlessly connect with Mueller Systems Model 420 RDM (Remote Disconnect Meter) that allows easy and secure remote valve actuation to turn water service on and off”, (Exhibit 4 at RT009376), The pilot valve can be actuated vis the User Interface from any web enabled device with the proper log in and password”, (Exhibit 5 at MUE000000121),

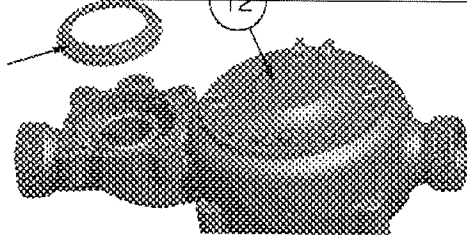
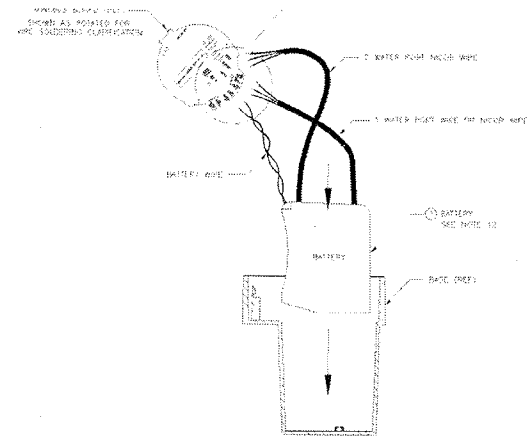
“Remote Disconnect Enabled Compatibility”
“Compatible with Mueller Systems 420 RDM, water utilities can remotely initiate a command to turn water service on or off.” (Exhibit 3 at RT009371)



(Exhibit 5 at MUE000000121)


interposed between a main water line and a water supply for said building or structure water system;
“External straight pipe threads (NPSM)” and
“CONNECTIONS: Supplied with external straight pipe threads (NPSM) per ANSI B1.20.1”, (Exhibit 5 at MUE000000094 and MUE000000097),

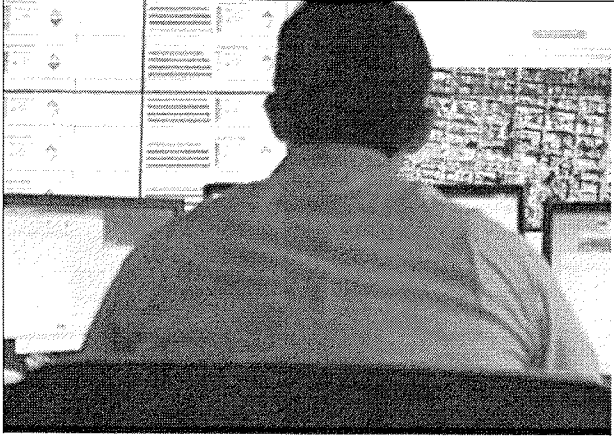
	 <p>(Exhibit 9 at RT009384), and https://muellersystems.com/ https://muellersystems.com/420-remote-disconnect-meter-rdm/</p>
<p>said base station further comprising;</p> <p>a) electrical circuitry including at least one of a first CPU, microprocessor, and microcontroller with a power source;</p>	<p>The Mueller 420 RDM and SSM with Mi.Net® LW Meter Interface and Cellular Node Meter Interface with Mi.Net® has an electrical circuitry; “coated electronic board”, (Exhibit 1 at RT009366 and Exhibit 2 at RT009368), comprising at least one of a CPU, microprocessor and microcontroller [one skilled in the art would understand that a CPU or microprocessor with software instructions would be necessary to provide the functions of the water meter, such as organizing the recording and transmitting of water data to a remote source, remotely turning the water control valve on and off, etc.], and https://muellersystems.com/ https://muellersystems.com/420-remote-disconnect-meter-rdm/</p>
<p>b) one or more flow rate sensor connected to the main water supply and connected to said electrical circuitry and designed to monitor at least one of a water use data, water energy use data, water quality data and leak detection information from said building or structure, said one or more flow rate sensors connected to the main water supply and connected with said electrical circuitry;</p>	<p>The Mueller 420 RDM and SSM with Mi.Net® LW Meter Interface and Cellular Node Meter Interface with Mi.Net® system has one or more flow rate sensors, said water supply and electrically connected with said electrical circuitry; “As water enters, it moves the disc (nutates), forcing a known volume of water out of the meter from the opposite side of the disc”, (Exhibit 5 at MUE000000119), “Measuring element, Nutating Disc PD Chambers”, and (Exhibit 8 at RT09383),</p>

	 <p>(MUE000000121), and https://muellersystems.com/ https://muellersystems.com/420-remote-disconnect-meter-rdm/</p>
<p>c) said power source is at least one of an AC powered, DC powered, and one or more standard or rechargeable batteries, said rechargeable batteries capable of being supplemented with a turbine or other rotational mechanism that generates electrical energy, said power source is electrically connected to said electrical circuitry;</p>	<p>The Mueller 420 RDM and SSN with Mi.Net® LW Meter Interface and Cellular Node Meter Interface with Mi.Net® has at least one of an AC power source, DC power source, and one or more standard or rechargeable batteries capable of being supplemented with a turbine or other rotational mechanism that generates electrical energy; “coated electronic board”, (Exhibit 1 at RT009366) and (Exhibit 2 at RT009368). said power source is electrically connected to said electrical circuitry; “D cell lithium battery”, “...a large lithium battery to warrant 20-year battery life inside the meter pit”, (Exhibit 3 at RT009371), “Battery lifetime up to 20 years, (Exhibit 23 at MUE000000148), and</p>  <p>(Exhibit 14 at MUE000000007) https://muellersystems.com/ https://muellersystems.com/420-remote-disconnect-meter-rdm/</p>

<p>d) one or more wireless communication technologies comprising at least one of a LoRa, Sigfox, Ultra Narrow Band, 6LowPAN., NB-IoT, LTE-M cellular, and 5G cellular technology;</p>	<p>The Mueller 420 RDM and SSN with Mi.Net® LW Meter Interface and Cellular Node Meter Interface with Mi.Net® wherein said one or more wireless communication technologies comprising at least one of a LoRa, Sigfox, Ultra Narrow Band, 6LowPAN., NB-IoT, LTE-M cellular, and 5G cellular technology; “Transmit Frequency 902 MHz to 928 MHz”, (Exhibit 1 at RT009366), “Mueller Systems delivers the water industry’s first LoRaWAN Class B smart water meter interface unit with the new Mi.Net Node. Bringing the power of two-way communication between the node and the network down to the seconds, Mueller Mi.Net LoRaWAN (LW) node is truly a game-changer in defining the digital future of our cities.” (Exhibit 3 at RT009371 “The Mi.Net System operates in the 900 MHz band.”, (Exhibit 12 at RT009397</p> <p>“The Mi.Net system employs LoRa technology. LoRa, short for “low power, long range,” is an RF modulation technique that offers high-power transmissions and increased range over traditional systems with lower battery usage.”, (Exhibit 10 at RT009395),</p> <p>“Implemented with LoRaWAN Class B specification mode, the Mi.Net LW Node is the only solution in the water metering industry right now that delivers the fastest two-way wireless communication with an unparalleled level of flexibility for long term deployment – all without shortening its battery lifespan. It permits on-demand data to be collected and transmitted remotely within seconds. Besides consumption data, alerts such as leak detection, no flow, reverse flow and register tampering are constantly monitored.” (Exhibit 4 at RT009375) https://muellersystems.com/ https://muellersystems.com/420-remote-disconnect-meter-rdm/</p>
<p>e) wherein said one or more wireless communication technologies utilizes authentication and encryption technologies for pairing operations and to prevent unauthorized access to the water data or information; and</p>	<p>The Mueller 420 RDM and SSN with Mi.Net® LW Meter Interface and Cellular Node Meter Interface with Mi.Net® wireless communication technologies utilizes authentication and encryption technologies for pairing operations and to prevent unauthorized access to the water data or information; (Exhibit 2, page 3, “Security, LoRaWAN employs two layers of strict security</p>

	<p>measures. With network security, it ensures authenticity of the node in the network, while the application layer of the security ensures the network operator does not have access to the end user's application data") and (Exhibit 3 page 1 "Security LoRaWAN by design is very secure – authentication and encryption are, in fact, mandatory. With two session keys, the Network Session Key (NwkSKey) and Application key (APPSKey) to prevent spoofing and eavesdropping), and https://muellersystems.com/, https://muellersystems.com/420-remote-disconnect-meter-rdm/</p>
<p>f) wherein the long-range LoRa, Sigfox., UNB, NB- IoT, 6LoWPAN, WiMAX., cellular technology 3GPP and LTE-M and 5G consist of a duplex technology to both receive at least one of a water use data, water energy use data, water quality data and leak detection information and send commands to regulate the control valve mechanism;</p>	<p>The Mueller 420 RDM and SSN with Mi.Net® LW Meter Interface and Cellular Node Meter Interface with Mi.Net® utilizes long range LoRa and cellular wireless technology long-range LoRa, Sigfox., UNB, NB- IoT, 6LoWPAN, WiMAX., cellular technology 3GPP and LTE-M and 5G consist of a duplex technology, "True two-way, command and control functionality", (Exhibit 10 at RT009387) [duplex refers to two-way control] to both receive at least one of a water use data, water energy use data, water quality data and leak detection information, "Deliver enhanced services through a customer portal", (Exhibit 10 at RT009392), "The Mi.Net data portal improves your service and conservation efforts an online view of their water usage using a personal computer or mobile app. The interactive portal graphically present real-time and historical usage data collected by the Mi.Net system enabling customers to: monitor water usage, configure individual alerts, identify inconsistencies that may indicate the presence of leaks", (Exhibit 10 at RT009393) and send commands to regulate the control valve mechanism; "Bringing the power of two-way communication between the node and the network down to seconds", "Remote Disconnect Enabled Compatibility" and Compatible with Mueller System 420 RDM, water utilities can remotely initiate a command to turn a water service on or off", (Exhibit 3 at RT009371) "The MiNet LW node has the built-in capability to seamlessly connect with Mueller Systems Model 420 RDM (Remote Disconnect Meter) that allows easy and secure remote valve actuation to turn water service on and off", (Exhibit 4 at RT009376), "The pilot valve can be actuated vis the User Interface from any web enabled</p>

	device with the proper log in and password”, (Exhibit 5 at MUE000000119), and https://muellersystems.com/420-remote-disconnect-meter-rdm/ , https://muellersystems.com/network-operations-center/
the CPU, microprocessor or microcontroller can at least include one of a programming setting managed by the user, remotely a mode setting, and a default or restricted setting processed by the manufacturing factory to:	The Mueller 420 RDM with Mi.Net® LW and Cellular Node has a CPU, microprocessor or microcontroller can at least include one of a programming setting managed by the user, remotely a mode setting, and a default or restricted setting processed by the manufacturing factory to:
a) record the water flow event to a local memory bank or removable memory device for regional or controlled analysis,	The Mueller 420 RDM and SSM with Mi.Net® LW Meter Interface and Cellular Node Meter Interface with Mi.Net® record the water flow event to a local memory bank or removable memory device for regional or controlled analysis; “Information retrieved from a water meter is stored temporarily with the node’s non-volatile internal memory”, and “Logs and stores 105 days of hourly data meter data in internal memory”, (Exhibit 1 at RT009366) “2MB Solid-state Flash Memory for dedicated storage of readings” and . “Configurable data storage” . . . 8-digit electronic reading in ACSII format where it can be recorded and maintained . . .”, (Exhibit 11 at MUE000000341 and the SSM water meter in Exhibit 23 at MUE000000148), “Network Operations Center”, (Exhibit 7 at RT009377 and Exhibit 10 at RT009394),  (Exhibit 10 at RT009389)

	 <p>(Exhibit 7 at RT009377),</p> <p>“The Mueller Systems Network Operations Center (NOC) based in the United States monitors water infrastructure for utilities across North America. The NOC is staffed by highly skilled analysts, each responsible for a specific group of Mi.Net customers. Proactively monitoring real-time network performance on the NOC’s nine-foot-high command screen, our analysts immediately alert you if they detect an anomaly — enabling quick resolutions to problems, and a highly optimized network. Freeing your utility staff from monitoring network data enables focusing on your core utility activities, improving your infrastructure efficiency, and boosting your return on investment.” (Exhibit 10 at RT009394), and https://muellersystems.com/, https://muellersystems.com/420-remote-disconnect-meter-rdm/</p>
b) combine a plurality of water low events into a local memory bank and subsequently schedule the transfer of the water flow event dataset to a remote computer or server, or to a cloud service company,	<p>The Mueller 420 RDM and SSM with Mi.Net® LW Meter Interface and Cellular Node Meter Interface with Mi.Net® “The node transmits water meter data to the LoRaWAN network daily”, (Exhibit 2 at RT009368) https://muellersystems.com/, https://muellersystems.com/420-remote-disconnect-meter-rdm/</p>
c) directly transfer the water flow event to a remote computer or server, or to a cloud service company, or	<p>The Mueller 420 RDM and SSM with Mi.Net® LW Meter Interface and Cellular Node Meter Interface with Mi.Net®, “Amazon Web Service (AWS) provides an added level of protection of the utility, homeowner and business data” (Exhibit 13 at RT009400).</p>

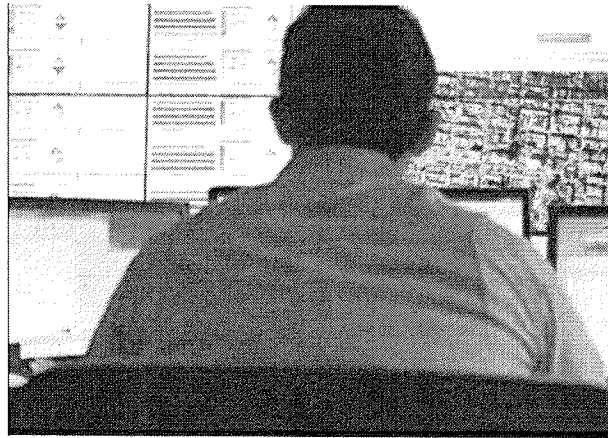
d) transfer the water flow data utilizing a blockchain format to one or more remote computers or servers, or cloud service company; and	N/A
the one or more wireless communication technologies capable of transmitting at least one of a 1) water use data, water energy use data, water quality data and leak detection information and, 2) obtains an instruction or signal to command the management of the water control valve or perform a command operation, using at least one of an Internet connection, a private network system, and a corporate owned network system, and a smart phone, computer, server, tablet, web portal, and other electronic communication device, that communicates with at least one of a remote computer or server, a commercial cloud-company, and a web-based company.	<p>The Mueller 420 RDM and SSM with Mi.Net® LW Meter Interface and Cellular Node Meter Interface with Mi.Net®, technologies capable of transmitting at least one of a 1) water use data, water energy use data, water quality data and leak detection information; “The node transmits water meter data to the LoRaWAN network daily, via an unlicensed radio frequency”, (Exhibit 2 at RT009368), “Implemented with LoRaWAN Class B specification mode, the Mi.Net LW Node is the only solution in the water metering industry right now that delivers the fastest two-way wireless communication with an unparalleled level of flexibility for long term deployment – all without shortening its battery lifespan. It permits on-demand data to be collected and transmitted remotely within seconds. Besides consumption data, alerts such as leak detection, no flow, reverse flow and register tampering are constantly monitored.” (Exhibit 4 at RT009375), “Deliver enhanced services through a customer portal”, (RT009392), and</p> <p>2) obtains an instruction or signal to command the management of the water control valve or perform a command operation, using at least one of an Internet connection, a private network system, and a corporate owned network system, and a smart phone, computer, server, tablet, web portal, and other electronic communication device, that communicates with at least one of a remote computer or server, a commercial cloud-company, and a web-based company; “REMOTE DISCONNECT ENABLED COMPATIBILITY - Eliminate the need for truck rolls; the node is compatible with Mueller Systems 420RDM. Utilities can remotely initiate a command to turn water service on or off” (Exhibit 2 at RT009369) “Remote Disconnect Enabled Compatibility” and “Compatible with Mueller System 420 RDM, water utilities can remotely initiate a command to turn a water service on or off”, (Exhibit 3 at RT009371), “The Mi.Net LW node has the built-in capability to seamlessly connect</p>

	with Mueller Systems Model 420 RDM (Remote Disconnect Meter) that allows easy and secure remote valve actuation to turn water service on or off.” (Exhibit 4 at RT009376), and https://muellersystems.com/ https://muellersystems.com/420-remote-disconnect-meter-rdm/
'837 Patent Claim 45	
A water meter and leak detection system as recited in claim 42 further comprising one or more communication hubs is in wired communication with the base station or having a wireless communication technologies corresponding with the one or more wireless communication technologies of the base station that transfers water use data water energy use data, water quality data or a leak detection condition to at least one of an Internet connection, private network system, and corporate owned network system that communicates with at least one of a remote computer or server, a commercial cloud-company and a web-based company.	The Mueller 420 RDM and SSM with Mi.Net® LW Meter Interface and Cellular Node Meter Interface with Mi.Net®, one or more communication hubs is in wired communication with the base station or having a wireless communication technologies corresponding with the one or more wireless communication technologies of the base station that transfers water use data water energy use data, water quality data or a leak detection condition , “The node transmits water meter data to the LoRaWAN network daily, via an unlicensed radio frequency”, (Exhibit 2 at RT009368), “Implemented with LoRaWAN Class B specification mode, the Mi.Net LW Node is the only solution in the water metering industry right now that delivers the fastest two-way wireless communication with an unparalleled level of flexibility for long term deployment – all without shortening its battery lifespan. It permits on-demand data to be collected and transmitted remotely within seconds. Besides consumption data, alerts such as leak detection, no flow, reverse flow and register tampering are constantly monitored.” (Exhibit 4 at RT009375), “Deliver enhanced services through a customer portal”, (RT009392), to at least one of an Internet connection, private network system, and corporate owned network system that communicates with at least one of a remote computer or server, a commercial cloud-company and a web-based company ; “Information retrieved from a water meter is stored temporarily with the node’s non-volatile internal memory”, and “Logs and stores 105 days of hourly data meter data in internal memory”, (Exhibit 1 at RT009366), “Network Operations Center”, (Exhibit 7 at RT009377 and Exhibit 10 at RT009394), “Amazon Web Service (AWS) provides an added level of protection of the utility, homeowner and business data” (Exhibit 13 at RT009400) [one skilled in the art understands that

using a cloud-company or web-based company transfers data over the internet for their services].



(Exhibit 10 at RT009389)



(Exhibit 7 at RT009377),

“The Mueller Systems Network Operations Center (NOC) based in the United States monitors water infrastructure for utilities across North America. The NOC is staffed by highly skilled analysts, each responsible for a specific group of Mi.Net customers. Proactively monitoring real-time network performance on the NOC’s nine-foot-high command screen, our analysts immediately alert you if they detect an anomaly — enabling quick resolutions to problems, and a highly optimized network. Freeing your utility staff from monitoring network data enables focusing on your core utility activities, improving your infrastructure efficiency, and boosting your return on investment.” (Exhibit 10 at RT009394), and

'837 Patent Claim 47	
47. A water meter and leak detection system as recited in claim 42, wherein an owner or user can communicate with at least one of a smart phone, computer, server, tablet, web portal and one or more other electronic communication devices that includes a software program application capable of displaying an icon, menu, or submenu at least one function of:	The Mueller 420 RDM and SSM with Mi.Net® LW Meter Interface and Cellular Node Meter Interface with Mi.Net®, owner or user can communicate with at least one of a smart phone, computer, server, tablet, web portal and one or more other electronic communication devices that includes a software program application capable of displaying an icon, menu, or submenu at least one function of:
(a) providing a graphical display of at least one of water use history, water energy usage history, and water quality history from a selected water fixture or water appliance, said history transferred from at least one of said base station, said remote central computer and the cloud service provider or web-based computer;	The Mueller 420 RDM and SSM with Mi.Net® LW Meter Interface and Cellular Node Meter Interface with Mi.Net®, providing a graphical display of at least one of water use history, water energy usage history, and water quality history from a selected water fixture or water appliance, said history transferred from at least one of said base station, said remote central computer and the cloud service provider or web-based computer;), “The Mi.Net data portal improves your service and conservation efforts an online view of their water usage using a personal computer or mobile app. The interactive portal graphically present real-time and historical usage data collected by the Mi.Net system enabling customers to: monitor water usage, configure individual alerts, identify inconsistencies that may indicate the presence of leaks”), (Exhibit 10 at RT009393),
(b) displaying an alarm condition based on one of said water use history, water energy usage history, or water quality history programmed into said base station	The Mueller 420 RDM and SSM with Mi.Net® LW Meter Interface and Cellular Node Meter Interface with Mi.Net®, displaying an alarm condition based on one of said water use history, water energy usage history, or water quality history programmed into said base station,), “The Mi.Net data portal improves your service and conservation efforts an online view of their water usage using a personal computer or mobile app. The interactive portal graphically present real-time and historical usage data collected by the Mi.Net system enabling customers to: monitor water usage, configure individual alerts, identify inconsistencies that may indicate the presence of leaks”), (Exhibit 10 at RT009393),

c) turning on or off the water supply by sending a command signal transferred to the base station.	The Mueller 420 RDM and SSM with Mi.Net® LW Meter Interface and Cellular Node Meter Interface with Mi.Net®,) turning on or off the water supply by sending a command signal transferred to the base station . “REMOTE DISCONNECT ENABLED COMPATIBILITY - Eliminate the need for truck rolls; the node is compatible with Mueller Systems 420RDM. Utilities can remotely initiate a command to turn water service on or off” (Exhibit 2 at RT009369) “Remote Disconnect Enabled Compatibility” and “Compatible with Mueller System 420 RDM, water utilities can remotely initiate a command to turn a water service on or off”, (Exhibit 3 at RT009371), “The Mi.Net LW node has the built-in capability to seamlessly connect with Mueller Systems Model 420 RDM (Remote Disconnect Meter) that allows easy and secure remote valve actuation to turn water service on or off.” (Exhibit 4 at RT009376).
(d) showing or modifying a program, setting, or a default menu incorporated within the base station.	(a), (b), and (c) met under “at least one function of”
e) specifying the water control valve mechanism operational position by sending a request to the base station.	(a), (b), and (c) met under “at least one function of”
(f) downloading updates or regional water rates into the base station; and	(a), (b), and (c) met under “at least one function of”
(g) programming a vacation or work water schedule into the base station.	(a), (b), and (c) met under “at least one function of”
'837 Patent Claim 48	
A water meter and leak detection system as recited in claim 42, wherein one of collection nodes are capable of including at least one of a mesh and/or and peer-to-peer technology circuitry that can communicate with at least one of another water meter collection nodes and communication hubs.	The Mueller 420 RDM and SSM with Mi.Net® LW Meter Interface and Cellular Node Meter Interface with Mi.Net®, one of collection nodes are capable of including at least one of a mesh and/or and peer-to-peer technology circuitry that can communicate with at least one of another water meter collection nodes and communication hubs , “This document specifies the Mi.Mesh protocol stack. This document details the precise mechanisms and message formats used to convey data reliably between two devices equipped with the radio modules. Flow diagrams, message format definitions, and transaction examples give a complete definition of the protocol as it appears over the air and in system memory.” and “The Mi.Mesh protocol stack is a frequency-hopping protocol that is designed to permit reliable data delivery

	<p>between any two nodes. The stack is divided into 4 layers, roughly corresponding to the open systems interconnect model. Layer 1, the physical level, is the 900 MHz spread spectrum radio and driver module responsible for over-the-air transmission and reception of data. Layer 2, the link level, is responsible for reliable point-to-point communications between any pair of directly connected nodes. Layer 3, the network level, provides networking functions including routing, message forwarding, and security. Layer 4, the application services level, is responsible for implementing the client and server processes that provide the basic mesh functions that MiNode applications require, including uploading data, priority message delivery, and device command and control.” (Exhibit 15 at MUE000000043) and Exhibit 20.</p>
'837 Patent Claim 49	
<p>A water meter and leak detection system as recited in claim 42, wherein one of more communication hubs are capable of including at least one of a mesh and/or and peer-to-peer technology circuitry that can communicate with at least one of another water meter collection nodes and communication hubs</p>	<p>The Mueller 420 RDM and SSM with Mi.Net® LW Meter Interface and Cellular Node Meter Interface with Mi.Net® one of more communication hubs are capable of including at least one of a mesh and/or and peer-to-peer technology circuitry that can communicate with at least one of another water meter collection nodes and communication hubs, “This document specifies the Mi.Mesh protocol stack. This document details the precise mechanisms and message formats used to convey data reliably between two devices equipped with the radio modules. Flow diagrams, message format definitions, and transaction examples give a complete definition of the protocol as it appears over the air and in system memory.” and “The Mi.Mesh protocol stack is a frequency-hopping protocol that is designed to permit reliable data delivery between any two nodes. The stack is divided into 4 layers, roughly corresponding to the open systems interconnect model. Layer 1, the physical level, is the 900 MHz spread spectrum radio and driver module responsible for over-the-air transmission and reception of data. Layer 2, the link level, is responsible for reliable point-to-point communications between any pair of directly connected nodes. Layer 3, the network level, provides networking functions including routing, message forwarding, and security. Layer 4, the application services level, is responsible for implementing the client and server processes that provide the basic mesh functions that MiNode applications require, including uploading data,</p>

	priority message delivery, and device command and control.” (Exhibit 15 at MUE000000043) and Exhibit 20.
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